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AUTHOR Traylor, E. B.
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ABSTRACT

Reported is research representing a continuation of a series of studies supported by the Cessna Aircraft Corporation. This study focuses on an aviation class in a medium-size city in Illinois in which the Cessna course plan was used. Information focusing on two questions is presented: the nature of students enrolled in an aviation course and the effects of this aviation course on the students. Data were collected through four instruments: Student Data Form, Air Age Attitude Inventory, Student Personal Reaction Form, and a Supplementary Information Form. Findings are reported by instrument involved. Some of these findings were: students enrolled in aviation classes represent a minority of high school students but enjoy some degree of status or prestige within the school social system in that they have moderately superior grade point averages, are active in school activities, and intend to continue their educational careers. (PEB)

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A Claim for Relevancy

A Continuing Study of the Characteristics and Motives of Students in an Aviation Class and the Influence of the Class on these Students

E. B. Traylor
Department of Educational Psychology
Wichita State University
1972

The research reported here was performed with the cooperation of Cessna Aircraft Company, Alton Public Schools, and the support of Cessna Aircraft Company.

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Introduction

The present study represents a continuation of a series of studies supported by Cessna Aircraft Corporation. The first study was performed during the school year 1967-68. At that time six senior high schools in Big City were initiating new courses in aviation. Cessna Aircraft Corporation showed an interest in these programs and provided assistance for some initial research and evaluation efforts. As a result of their interest, a study was designed, initiated and concluded looking at the effects of the course on the participants. Up, Up, and Away was reported in 1968. This study described the students who participated in the program. Efforts were made to look at their academic life, their school social life, the future vocational plans, as well as the effect that the course had on the students' attitudes toward aviation.

During the school year 1969-70 the Up, Up, and Away study was replicated. In the summer of 1969 during a Cessna sponsored workshop for aviation teachers, it was decided to extend the original study to include geographical representation more characteristic of the total population of the United States. Eight schools outside of Kansas and two of the schools included in the original Up, Up and Away study were included. The results of this rather ambitious and extensive study is reported in a document entitled, "I Would Rather Be Flying" prepared in 1970 for Cessna Aircraft Company. Chapter V of that study is really a separate study, focusing on one high school in Seminole, Oklahoma. A more intensive study of that school was made because of circumstances that enabled us to have access to a considerable amount of data and students. Seminole provided the opportunity to standardize and establish norms on instruments used in earlier studies.

The present study is focusing upon an aviation class in a medium size city in Illinois. This school selected was using the Cessna course plan. In that respect some generalizations could be made to other schools using the same curriculum. Since the school and instructor were willing to cooperate, it was felt this would be an opportunity to extend the earlier studies and learn something of the effects of a more or less standardized curriculum. While the earlier schools had similar curricular elements, wide variance was possible.

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Part 1 - The Rationale of the Study

This study is the third in a series of studies initiated in 1967 and supported by Cessna Aircraft Company. Up, Up and Away was the study of aviation programs in six high school in Big City. "I Would Rather Be Flying" was a study of ten selected high schools throughout the United States. The present study is of one additional secondary school, Hill City in Illinois.

While the general purposes in this study are the same as the ones in the previous studies, we hope to have some additional clarification and validation of these findings. The basic questions are (1) who takes an aviation class in high school (2) what is the effect of such a class on the student? In this study, Hill City had the additional feature of a more or less uniform curriculum.

We have argued earlier that the findings of the study could be useful to a number of people and publics. In routine advisement and management policies it would be useful to educators generally to know the nature of the student interested in the aviation course. To teachers of such courses, the knowledge of the type of student enrolled is of immediate value. To students the awareness of their peers' interests and what courses are attractive to them will help to influence their selection of courses. The findings should be useful to teacher training institutions attempting to plan for the preparation of teachers for aviation classes. Finally, we would suggest that communities, school boards, and more general populations interested in educational programs would find it useful to have information about the nature of the students enrolled in the aviation classes and the effect of the course on the students so that more intelligent contributions could be made to the decisions about supporting programs in their schools.

Our earlier findings have suggested another and important purpose of this study. At a time when there is considerable concern about relevancy of educational programs, relevancy of curriculum, and interest in courses, our findings should be useful. Indeed, we have in our earliest studies, indicated that students enrolled in aviation courses do find them of considerable interest compared to regular courses in the school. They value them highly. In the Seminole school system we discovered that the aviation courses not only had an interest for the students in the course but it had a pervasive influence on the student body as a whole. This interest was translated into an interpretation of the course as being a very vital, meaningful, exciting (and difficult) course.

We would argue that if aviation courses in the school do have this kind of an impact on their students, do indeed make this kind of an impact upon the school as a whole, they deserve more careful study in order to find what elements of these courses are generalizable to other aspects of the curriculum and how the school can organize itself so that the more interesting and relevant aspects of such a course can be implemented in other ways; how can the central features of the course be translated into programs that more students have an opportunity to contact. The questions being asked - the data being collected from the students in this aviation class - were designed to get at the basic questions listed above. The reasons for these particular focuses have been argued in the earlier papers.

Part 2: The Problem

While classes in aviation are present in schools all over the country there has been no systematic study of these classes. Questions related to the nature of the curriculum, the background of the instructor, the nature of the student's enrolled in the course, the effects of the course on the students, the position of the class in regard to the sequence of other courses in the school, as well as the support given to the course by the administration and community are all to be answered. There is no systematic record of studies of any of these questions. Obviously, educational planning and decisions related to all curricular matters and support for these matters need to be based on a body of information. When no information exists, all that is available for the decisions are attitudes, opinions, and speculations. These are hardly the raw materials needed for intelligent planning for schools in the future.

This report deals primarily with two of the above questions: the nature of students enrolled in an aviation course and the effects of this aviation course on the students. To some extent the matter of curriculum is considered but only obliquely. Specifically, we are attempting again to describe those students who are enrolled in aviation course in one high school and to see if the aviation course has some effect on the students in terms of their attitudes toward aviation, and in terms of ability to utilize the cognitive dimensions of the course. We will also determine the feelings of the students about the course and its structure. A year enrolled in aviation course will have an effect on the attitudes of these students, toward aviation generally. We would expect them to be more favorable disposed to phenomena related to aviation, to have a greater respect for the contribution aviation has made to society generally. Obviously, the effect of the course on their attitudes toward aviation would be related to the attitudes they have to the course. If they like the course, favorable attitudes toward the subject of the course should result. The opposite is true also. We would also expect them to demonstrate greater ability to make applications of some of the concepts that are taught in an aviation course toward more general concepts related to weather, mathematics, and physical sciences.

While no other hypotheses are offered, we expect to obtain descriptive data about the students in the aviation course. Do they occupy some unique position in the school social system? In our effort to make this determination inquiries were made in terms of the number of activities participated in school, the nature of their future educational plans, nature of their contacts with other students, their performance in school as measured by grade point average, and the courses that were of most and least interest to them.

In the remainder of this paper we will describe the method used, the nature of the student's responses to an Inventory designed to determine attitudes toward aviation as well as some anecdotal data collected by self reporting documents that were provided to the students, both early in the year and at the end of the aviation course. Finally, an effort will be made to synthesize the findings of this study with data that were collected in previous studies of aviation classes.

Part 3: Earlier Findings

Up, Up and Away and the "I'd Rather Be Flying" suggested that the students in aviation classes were identifiable within the school's social system. Anecdotal data collected from the students in the preceding studies indicated, among other things, that the vast majority were planning to continue their education after attending high school. It was also noted that the academic performance of the students was above average within their schools. While many of them received academic honors this was not characteristic of the group. Rather the characteristic grade point average of the group was "better than average" but below the "brilliant student" image. It was also determined that most of the students in the study participated considerably in extracurricular activities with the majority of their activities being school oriented. These data, when applied to other studies of adolescence (James Coleman, Adolescent Society, 1961, and Youth in Two Worlds, 1972) suggest that these criteria would tend to indicate that the aviation student enjoyed a degree of status within the school community as a whole. These findings were true generally for all of the schools previously studied. Obviously, the implications of these findings are useful in planning future programs for aviation.

Other information collected from the personal data sheets of the students in the preceding studies suggest that most felt a real interest in flying and found that the aviation class was of interest to them. In a time when the "relevancy" issue seems to be so important it should be useful to educational planners to attempt to make analysis of courses that students perceive to be "very interesting". Considerable criticism at present is directed to the issue of "dry, dull, non-relevant" courses. The students reporting from the studies made previously suggest that the aviation class indeed is not such a class, with highest recognition being given to the class as one of the most interesting. This was true, not just with students in the aviation class but the aviation course had an image of "interest and relevancy" that seemed to be pervasive through the entire school (I'd Rather Be Flying", Ch. 5). Students in one high school not in the aviation classes gave their impression of the aviation class. There was a general pervasiveness of the influence of this calss on the whole student body. Whether this was unique to the aviation class at Seminole, whether it was unique to the Seminole school because of the size, are questions unanswered. However, it does seem to be instructive and of some use in educational planning to see if there are elements of the aviation course that have generalizability to other courses so that whatever the elements of interest and enthusiasm about these courses are, they can be incorporated or modified to the support of other classes.

It was also found that the majority of students enrolled in aviation classes had favorable attitudes toward aviation initially. Yet while there was not a dramatic increase in more favorable attitudes during the course of the year the initial high attitude was sustained in all instances. (There was one instance in the Up, Up and Away study of a school in which the aviation students showed less favorable attitudes at the end. The resolution of the dilemma was somewhat reduced in the second study where that school was again included and a favorable attitude was sustained during the year. In that school, a different teacher was involved the second time). We would expect the findings from this school to contribute to either supporting or discrediting the earlier findings.

Part 4: What We Did

The aviation class at the school was already in progress when the initial data collection began. Data were collected through four instruments, and during the school year. The instruments are listed in the Appendix. Appendix A is a student profile form used to collect information relative to the occupation of the student's parents, their classification in school, the courses of most interest to them in school, the courses of less interest, the courses where they get the best grades, and the nature of their participation in school and out of school activities. Also included were questions related to student's future educational plans and future plans as they are related to aviation.

Appendix B was the instrument that had been utilized in collecting data about the attitudes of students toward aviation. This instrument was used in the studies of the other sixteen schools previously noted. The instrument is designed to elicit feelings from students about issues related to aviation. This is a broadly based aviation attitude survey with feelings about aviation as it relates to political, social, and economic aspects of society. The plan was to allow the students to respond early in their educational experience and then to give them an opportunity later in the school year to respond to the same inventory. The pre-post design was to see if changes of attitude did develop. Earlier experience with this instrument indicated that students enrolled in aviation courses have significantly higher or more favorable attitudes toward aviation initially than students not enrolled in such courses. It has also been noted that usually the aviation students do not show a significantly more favorable attitude at the end of the course but that the initial high level of attitude is sustained.

Appendix C is the form used for additional information obtained from the students in January. The data were used to help validate some of the earlier data collected on the personal data sheet as well as to measure some of the less structured dimensions of their feelings about the aviation course.

Appendix D was mailed in May and was an effort to try to obtain supplementary information from the aviation students. Information requested generally dealt with the student's evaluation of the course as it related to other courses and the amount of time spent on the course. We also solicited their opinions about the nature of the course and its value to them.

The findings from each of these data collection instruments will be reported in the next section. Each section will be reported by instrument. Those who have had the opportunity to read other studies of aviation classes will be able to make some comparisons between the class at Hill City and those other classes studied earlier.

Appendix A: Results

Table 4.1 presents the summary of data collected from our student profile instrument. Of the 21 students; 15 of them were seniors, 6 were juniors. Only two of the students reporting were females. This is somewhat consistent with the findings earlier. Approximately 10% of the students involved in the other aviation classes were female students. Students at Hill City are divided by sex in about the same proportion. Some questions could be raised about the reasons for the sex differences. In classes that are essentially elective classes and where the instructors are men, one might expect the class being more attractive to males.

Table 4.1
Summary of
Student Profile Form

Students responding

Level	Sex: Male	Sex: Female
Seniors	13	2
Juniors	6	0

Self report of Grade Average

A	2
B	6
C+	6
C	6
C-	1
D	

Courses indicated of Most Interest

Science	10
Aviation	7
Math	4
History	3
Other	9

Courses of Least Interest

English	9
Social Science	4
Language	2
Other	4

Best Grades

Science	6
History	5
Aviation	4
Other	6

Future Educational Plans

College	19
Technical School	1
None	1

Table 4.1 continued
Frequency of participation in Activities

	In school	Out of school
4 or more	3	2
3	3	4
2	4	4
1	6	10
0	5	1

Aviation Orientation

Have you flown? Yes 9

2 or less 6
Infrequent 3

No 12

Do you plan to get a pilot's license? Yes 12

Private 10
Commercial 2

No 3

Whether this is as it should be, is another question. One might speculate as to the attractiveness of the class for female students if the instructor were a woman. Indeed, at Seminole where the aviation class was team taught by a man science teacher and a woman social studies teacher the number of girls enrolled in the course were 20% of the total body. It would be of some interest to speculate what the sustained and regular enrollment of girls in such a course would be if the instructor of the course were a woman.

The self report of grades indicated that the students were probably in the upper half of the student body as far as GPA was concerned. There was a difficulty in trying to classify the report of the students. Our experience with self-reporting grades in Up, Up and Away indicated that students tend to report somewhat lower GPA than that really attained. In spite of these difficulties it would seem that the distribution suggest that none of the students have a GPA below C which would seem to be keeping with the high number of seniors in the course. However, it would seem this group of students have a slightly lower GPA than the GPA of students in other classes surveyed.

Again, we asked questions about courses that were of most interest and least interest to the students as well as the courses that the students received the best grades in. The summary of the information indicate again somewhat similar results to the earlier studies. One third of the students (7 of 21) indicated that the aviation course was the one of most interest to them. The next highest category indicated science. However, our classification system included putting together any science course into the general category of "science", so aviation was the most frequently mentioned individual course as having the most interest. Coupled with that is the indication that only one student listed aviation as being the course of least interest to them. It was indicated by four of the students that aviation was the course they received their best grades. However, of the four students who listed aviation as their best grades course, only two of those listed aviation as being the course of most interest to them. The relationship between the reporting courses of most interest to grades received is one somewhat ambiguous. It is difficult to determine whether or not the interest in the course produces the best grade or whether the best grade produces the most interest in the course. However, our plan for having students list the course of most interest and least interest was originally designed to try to provide a forced choice for students to get a higher level of discrimination between the courses they were taking. That fully one-third of the students indicated that aviation was the course of most interest to them should speak of the relative strength of that interest.

Our findings in terms of the participation in activities of the students in the aviation classes are somewhat different than the findings in other studies. We found more of the students in this course being less involved in school activities and out of school activities. In the past we have argued that the students in the aviation classes represent students in a favorable position in the school social system because of their GPA, their identification in school activities, and their identification with other students in the school who are also planning to attend college. It would appear that the class at Hill City is somewhat different than the previous classes. Some explanations for this difference might be found. Many of the students indicated an address outside the city proper. It might very well be that most of the students in this class or a significant fraction of them are bused into Hill City High School. If this is indeed true, an explanation for their lack of participation in school activities would be evident. It should be pointed out that two of the students in this class were in the Student Council and several were in the interscholastic athletics. Both of these activities are associated

with relatively high status in the school social system. Our concern about status in the school social system has to do with the relative impact that the class would have on other students. Students who enjoy privileged positions in the social system would tend to participate in activities that are more attractive to other students in the school. Whether or not this is characteristic in Hill City is questioned.

The final area of inquiry on the initial data collected had to do with the orientation of the students to aviation. Table 4.1 indicates results that are again quite consistent with the results from the other studies. The initial amount of actual experience with flying is rather minimal. Only nine of the students of the twenty-one reporting, had some aviation experience. Most of it was minimal, one or two flights or less. Again, as the data from the other studies indicated many of these students were planning to obtain a pilot's license with most of them being interested in receiving a private pilot's license. Several of the students in the study had indicated an interest in some kind of career with aviation as its base. Two of the students indicated an interest in becoming commercial pilots and several others indicating some interest in the technical or support occupations related to aviation.

Appendix B: Results

Appendix B indicates the instrument used to determine the general favorableness of the student's attitudes toward aviation in general. Table 4.2 presents the findings of the students responses to this instrument. The initial Air Age Attitude Inventory mean score was 85.[illegible] At the end of the year the mean was 88.3. A T test to analyze the results found that the attitudes at the end of the year were more favorable, significant at the 5% level. These results seem to be somewhat consistent with results from the earlier studies. The initial attitudes toward aviation was quite favorable as represented by a score of 85.33 and during the year this high level of interest was sustained and even improved. While most of the schools in earlier studies did not show a significant increase in favorable attitudes, they did indicate a sustained interest and an interest change in favorable direction. The difference at Hill City was significant. This class indicated a more favorable attitude at the end of the year. Other data tend to support this finding. The data collected on the instrument listed in Appendix C asked students to indicate how they felt the course influenced them. The responses were in the direction of their desire to fly, the amount of actual flying, attitudes about flying and their interest in flying. All of these indicate either an equally strong or stronger support for flying than they had prior to the course. Appendix D, given considerably later in May, also suggested the influence of the course was sustained and continuous. In May, several months after they responded to Appendix B, students responses on Appendix D indicated strong, favorable feelings about aviation.

Appendix C: Results

Briefly, Appendix C was given in January to the students at the time they were taking the Air Age Attitude Inventory post test. In this instrument we were trying to get at some subleties of the student's feelings about the course and about their attitudes toward aviation. No table is made summarizing these responses since most of the responses were individual and categorizing them would be difficult. However, question three asked the students what they thought was the most important feature of the aviation course. Most of the students' responses had to do with the safety of aviation, an interest in the content, learning how the plane works, an interest in methods, that is, the films shown and an interest in the actual experience of flying.

Table 4.2
Analysis of Attitude Inventory Scores
for Students in Aviation Classes
at Beginning of Year and End of Year

Aviation Students	Mean	t	P
Beginning	85.33		
End	88.33	1.8867	.05

These responses might be useful for those interested in the substance of the aviation course. Unfortunately in an open ended question of this kind it is difficult to get specific responses. However, the responses made to this type of question have a unique meaning. The student is required to think back over the course, make discriminations and feel strongly enough about the questions to respond. In the case of these students the significant "features" of the course were essentially curricular. They apparently felt strongly enough about the course to respond (all of them responded) and the responses were related to the activities and sequence of activities. Statements such as : "films", "learning the mechanics of and promoting the ambition of wanting to fly", "learning the fundamentals of flying", and "learning to prepare for and to cope with situations while flying" are related to the curriculum which these students saw as being the "important features".

Question 4 asked how students felt the course influenced them. All of the students made favorable responses. Most of them indicated the desire to fly was either equal to or greater than it was initially. Many of the students indicated that their experience with actual flying was a valuable and exciting experience; they liked it. Their attitudes about flying showed structured change. They anchored their attitudes in specific statements. Frequently mentioned was the idea that they wanted to fly; they liked to fly. Also pointed out was that flying was safer than they had originally thought. They indicated that the flying was an expensive activity. The global response was typically given in terms of the interest in flying. One of the expressions that probably comes closest to capturing the sentiments of the majority of the students, that it was "a great experience".

As an optional question we asked these students who had been involved in an aviation course to express themselves to the desirability of the school offering such courses. The respondents indicated uniformly that they felt such a course should be available to students. No one indicated that the course should be required but they all indicated that they felt the course should be available. Specifically, they felt it would be useful to have smaller classes of perhaps twelve students, so that their would be more opportunity for individual instruction and individual participation. Five of the students indicated the need for additional teachers in the field of aviation. Two students thought there would be an advantage of having an advanced course for students, and two of the students indicated they considered it a privilege to be able to take a course in aviation.

Appendix D: Results

In May we sent an additional supplementary information form. Fourteen students responded. The results of the supplementary information form (Appendix D) are reported in Table 4.3. In part the questions are somewhat repetitious. However, the form was somewhat different and the timing was at the end of the school year three months later than responses to other instruments relative to the course. Students indicated something about the interest in the course as related to other courses they had. The results indicate that most of the students found it to be considerably above average. Another part of the interest question has to do with the amount of time that a student is willing to spend. We asked them how much time the course demanded in terms of the time they spend on their other courses. Most students spent the same amount of time or more on aviation as they did on any other course they took. Of interest to us was the next question in this sequence, which asked the student to evaluate the effect of the time spent. We asked them about their attitudes toward the time spent studying the aviation course. As the results suggest, all of the students indicated that they enjoyed working on the aviation

Table 4.3
Summary of
Supplementary Information Form

Students responding

		Sex	
		Male	Female
Level	Seniors	6	1
	Juniors	6	1

Comparison of aviation course to others taken:

	Most	One of most	Average	Less	Least
Interest	14%	58%	28%		

	More	As Much	Average	Less	Least
Demands on Time	14%	28%	44%	14%	

	Enjoyed More	As Much	Less	Least
Attitudes toward Time Spent	28%	72%		

Recommendation for establishing aviation course

Strongly Recommend	Recommend	Discourage	Strongly Discourage
64%	36%		

General education value

	Yes	No
Science	78%	32%
Social Studies	14%	86%

course as much or more than any other course they took in school.

Again, we asked the students to indicate whether or not school should encourage aviation classes. Of the students that responded 64% strongly recommended that such courses be established. In an effort to try to get at the generalizability of the content of the course, we asked the question related to the general education value of the course. We particularly asked them to indicate whether they felt the course content could be integrated into other areas such as science, or social science. 78% of the students felt that the aviation course contributed to their understanding and information about science. In terms of social science contribution it appeared that most of the students did not see any direct relationship between the activity and content of aviation course to the broader concerns of social science.

Part 5: Where Are We Now

Five years have elapsed and seventeen schools have been studied since the original intent to look at the students enrolled in the aviation courses was expressed. It should be of interest to attempt to summarize some of the findings to see the implications for education. First, one would agree that most of the students who enter these aviation classes represent a minority of students in the high schools. In the schools surveyed in "Up, Up and Away", "I'd Rather Be Flying", and the present, suggest that the students, while representing the minority of students in schools, are probably students that enjoy some degree of status or prestige within the school social system. These students enjoy moderately superior grade point averages, are active in school activities; intend to continue their educational career; all of which are criteria indicating that the students enjoy status within the school social system.

What does this mean? This means, in part, that since they enjoy status within the system they tend to attract other students to activities that they participate in. They help to set norms for the school. In regard to curricular decisions, it would seem that courses attracting students of this category would have appeal to other students in the schools, and since the majority of students enrolled in these courses are "attractive", the teachers who have the responsibility for aviation would enjoy some degree of status within the teachers social system (if, for instance, the majority of students enrolled in the course were marginal students, underachievers or lower achievers, aviation teachers would tend to kind of have a "black mark" against them by teaching another "remedial" class).

Most of the students who participated in the aviation courses were already oriented toward aviation favorably. Indeed, from the data collected, the actual advisement of students to take courses was nonexistent within the schools. That is, the regular school structure did not provide the incentive or encouragement for a student to enroll in the aviation course. Usually the student enrolled in the aviation course because of an interest in aviation, because of fellow students who were involved in the course or because of some tentative interest in aviation related occupation.

Students, when they finished the courses, had considerable more interest in aviation, had more interest in the course, were impressed with the kinds of activities that went on in the course and indicated this interest by expressing a wish to continue flying and obtain a pilot's license, usually a private license.

Students enrolled in the aviation classes had a high level of initial interest in aviation. During the course of the year the students maintained this high level of interest and in the case of some of the schools, and Hill City especially, the interest was expressed in significantly more favorable attitudes toward aviation and its contribution to society. While one might expect that students enrolled in elective course in aviation would have a high initial interest in aviation, one would expect that in the course of events, when natural processes were in operation, over a period of a semester or year some students would become disenchanted with the selection they made on the basis of some kind of romantic and unanchored interests. (You will remember that, in most instances, students in aviation courses had this high level of interest in aviation and favorable attitudes were expressed towards aviation, however, they had had practically no experience with aviation as such). In these courses the students were not "disenchanted" with aviation as their experience became greater. In fact, their interest remained high and in most

instances higher than initially.

In addition to the measured attitudes towards aviation through the attitude inventory, students expressed their interest in aviation in more positive forms after having gone through a course in aviation. We consider this to be very important. We consider it important because it is not at all unusual for students to be initially attracted to subjects on the basis of some kind of romantic or exciting orientation only, as the routine of the course became cumulative, to become somewhat disappointed. This was not the case with aviation. Students expressed their interest in aviation in a variety of ways. They indicated both formally, on the attitude inventory, and informally through the questionnaires and in terms of comparing their aviation courses with other courses, that aviation was a very interesting course, one in which they spent as much time or more than they spent on their other studies, and yet they consider the time spent to be valuable and useful and appropriate. They did not begrudge the time spent on the aviation course.

At this point we would like to raise the question of relevancy. Education is being criticized from many fronts. The criticism comes not only from outside the school, from various publics, various adults, but also from the students within the school. The cry frequently heard from students in both secondary schools and colleges is that life in the school is dull, boring, uninteresting and quite separated from life. In a word they say it is "irrelevant". We would offer some of the findings of the studies that have been made in aviation education as being of some interest to educational personnel who would like to address themselves to the issues raised about the relevancy of education. We have found students in the seventeen schools studied to be generally of the opinion that the aviation course is relevant, that is, the aviation course is interesting, it demands time from them, they willingly utilize their time on it, they find the methods and the materials used in the class to be appropriate and valuable and they find the course speaking to their needs. This seems more remarkable when one considers that in no instance, of any of the schools studied, were we able to find some consistent and continuous stimulant for encouraging students into the aviation program. It would almost seem as if the aviation students find their way into the aviation course by accident, as far as the organized procedures for guidance of students is concerned. No regular reference is made to advisors, counselors, teachers, administrators, as being influences on the student's decision to take the aviation course. Rather it seems to be a fortuitous selection, occasionally a friend or a parent has indicated the interest in the student taking the course. But, by and large, it is quite by accident the student takes an aviation course, that is, in terms of regular planning as far as the school is concerned. This, at a time when most people in the administration and policy making of the school are very concerned about trying to couple students with academic programs that are meaningful and interesting. It seems a bit of a paradox that the students are not referred to the course as a means to arouse and maintain their interest.

(We wonder about the lack of reference to counselors by the students. Two student needs are addressed by our findings that should be of concern to school counselors. First is the interest expressed in the course. Are not counselors aware of this interest? Second is the obvious "career" dimension of the aviation courses. Again, it seems unusual that counselors are not aware of the opportunities available to students in aviation and if they are aware why this awareness is not translated into their advising students into the program.)

Students refer to the features of the courses as having some unusual educational relationships. The content of the course which is related to general physical science principals finds a means of application in terms of flying an airplane. Very simple relationships needed in most educational settings seems to be apparent in the aviation class. The step between theory and practice is a small one. From study in the books about principals of flight to the airplane that is actually flying seems to be a transition that helps to make the course to be exciting and interesting. Also, within the courses it seems that there are greater uses of materials and teaching aids, films are very frequently referred to. The implications for other curricula should be apparent.

Addendum

To Be or Not To Be

Relative Stability of Aviation Courses

We would like to raise a number of questions. These are questions that have pervaded our findings in the three studies on aviation education. The first question has to do with the apparent "bootlet" relationship of aviation courses in the school to the total curriculum. In the schools surveyed, all the courses in aviation were elective. While there was a general consistency in terms of the content of the course, there was obviously great differences. That is to say, there was no standardized curriculum for aviation courses in high school, as far as we could tell. The elements that seem to be the backbone of most aviation curriculum are elements that have to do with principles of flight, ground school. And activities that underlie the entire program, was an actual flying experience. No effort was made in the studies to determine the reasons or the influences on the inclusion of an aviation course in the curriculum. As far as we could tell, from the data we collected, aviation courses were introduced into the curriculum through intervention on the part of an interested teacher. There were no concerted efforts by organized community groups. There were no efforts by state departments, there was no professional teacher organization that applied pressure. It appeared the efforts to introduce programs was through an interested instructor. Obviously, this approach has some kind of a tenuous implication as far as stability of aviation course in the total school curriculum is concerned. It is also suggestive of a lack of personal support for the instructor of these courses.

On the basis of this observation we would suggest a need for a rather extensive effort on the part of people involved in aviation generally and specifically to try to find some kind of support for the instructors in aviation classes. We do not know what the nature of that support should be. Certainly efforts on the part of general aviation to provide instructional supplies, materials, should be applauded and continued and it appears that the efforts of Cessna to provide course outlines, guides, materials, references and a "stable" curriculum is most desirable -- and unique. But effort should be made to provide more of a reference group support for aviation teachers. Aviation teachers, on their own, have in many instances developed a kind of affiliated group of instructors with similar interests but most of these groups have kind of a spontaneous and inadequate base. Infrequently do they provide the kind of professional stimulation that reqognizes and encourages advancement for instructor within their fields. It would seem appropriate that bodies interested in the extension and continuation of aviation courses should also look at ways at providing some kind of a professional liaison with aviation teachers. A strong reference group that could provide them with some strength from the standpoint of professional support for their teaching activities in the aviation field but also to provide them with an opportunity to examine curricula, to study curricula, to plan curricula, and to advocate the instruction of new courses in schools. It would also seem that this kind of an organization could serve to acquaint the general public and state department of the value of aviation courses to the curriculum. (A separate feeling in line with this line of thinking is that if the base of the reference group has its roots in professional aviation it will be better received by teachers than if its roots are in professional teaching.)

One of the dilemmas of the aviation teacher is that he is not just an aviation teacher. Usually he is a science teacher that teaches a course in aviation. Sometimes he is a social studies teacher that teaches a course in aviation. The combination is great, but in practically every instance the aviation teacher has only a fraction, a minor fraction, of his time committed to aviation, while in the school. Under such circumstances it seems more necessary for them to have some kind of "external group" they can identify with that will encourage their interest in that teaching component that has only a fraction of time committed to it. Other professional organizations tend to keep him aware of and strengthened in terms of developments in mathematics, science, social studies, and so forth. Without comparable support in aviation it is difficult for the person to see that he can indeed advance through his professional activities in aviation. While we would agree, that it is very wholesome and desirable for the aviation teacher to have a high interest in aviation, that interest is not enough to insure aviation courses having a stable position in the curriculum. Unless there is some payoff, professionally, for teachers to invest time and energy in aviation, their professional interest will wane and time will be consumed in other instructional tasks.

Summer workshops sponsored by the Cessna Aviation Company for aviation teachers seems to be a useful and worthwile activity. It helps to provide some focus for aviation teachers. It gives recognition and creditability to their job as well as to provide them with important insights into curricular planning and knowledge of the field of aviation. But this is a humble effort with only a bare fraction of teachers being involved. This kind of activity duplicated and multiplied should be a useful ingredient to provide a continuous committment of teachers of aviation to a course and the field.

Most studies have indicated that many of the students recognize the contribution that the content of the course in aviation has to other courses particularly in the sciences. It would seem that some kind of a professional organization of teachers of aviation would be able, as a group, to introduce these activities to the regular curriculum. Since the students in aviation classes have indicated an interest in those activities and evaluated them as being very appropriate and relevant, it would be useful for a systematic study or analysis of curriculum (physical sciences particularly) to see how much of the actual activities of the aviation classes can be incorporated into more traditional courses. It would seem that this would be a very useful and desirable direction for aviation instructors to take. This kind of activity would serve many purposes aside from just providing a more enriched traditional course in science; it would help to legitimize the aviation concept in the minds of more recognized academic courses. Obviously the ability to integrate concepts into the traditional courses would have a broader effect on students since more students take the traditional courses than aviation courses. This integration of aviation concepts into the regular curriculum cannot be accomplished easily. There needs to be some direction and some encouragement and probably best be obtained through concerted efforts of professional groups. All of which helps to underscore our earlier advocacy of some important reference group for aviation teachers.

Another factor of the courses needs to be looked at. There is in educational literature a voiced concerned for trying to integrate community with the school. This effort is to try to utilize resources of community and business and industry to support the curriculum. At the same time there seems to be some kind of suspicion on the part of professional educators for an industrial organization to show too much interest in school activities. It would seem to be useful for more of a

cooperative effort conscientiously planned on the part of industrial and business groups associated with aviation to make important contributions to the programs in the school. While I realize there are some dangers to this kind of effort the danger will be far surpassed by the potential benefit such cooperation can develop.

Appendix A
(Initial Data Collection)

Student Profile Form

1. What is your name: Address:
   Age:
   Sex:
   Classification in school:
   Parent or parents occupation:

2. In school what courses are of most interest to you?

   1st:

   2nd:

   What courses are of least interest?

   1st:

   2nd:

   In what courses do you get the best grades?

   1st:

   2nd:

   As near as you can determine, what is your grade average while in high school?_____.

3. What activities do you participate in? In which ones are you most active? Which ones are of most interest? (Try to separate your involvement in activities into "school activities" and "out of school activities".) List the activity, underline the ones of most interest and beside it indicate any office you have held, etc.

   School Activities Out of School Activities

4. Are you planning to continue your education after high school?_____. In what way? (College, business school, trade school, etc.)_____
_____

5. Which of the following statements best describe the people you run around with? (Check each statement that applies).

_____Most are students at this school.
_____Most are from another school.
_____Most ar involved in many school activities.
_____Most are planning to go to college.

6. Why did you decide to take this aviation course?

Who influenced you?

7. What is the extent of your involvement with aviation before taking this course?

Have you flown?_____

How frequently?_____

Do you plan to become a pilot?_____Private_____Commercial_____

Do you plan to prepare for employment in some aviation related occupation?
_____What?_____

Do you enjoy flying?_____

8. What do you think is the most important feature of this aviation course?

Appendix B

Name: _____

Air Age Attitude and Understanding Inventory

The following questions are designed to determine your feelings about aviation and its impact on many aspects of your life. There are no right or wrong answers in a sense since the purpose of this instrument is to determine your feelings. In each of the following instances indicate the degree of your feeling about the statement.

1. Aviation, though a faster means of transportation, is less safe than travel by by train or bus.

Disagree strongly	Disagree	Agree	Agree strongly

2. Since the number of airplanes and the amount of air travel is increasing, the percent of air accidents is increasing also.

Disagree strongly	Disagree	Agree	Agree strongly

3. The cost of producing airplanes is so great, that the aviation industy is unlikely to expand.

Disagree strongly	Disagree	Agree	Agree strongly

4. Air travel is so expensive that the most people with average income will be unable to fly.

Disagree strongly	Disagree	Agree	Agree strongly

5. Manufacturers and business leaders will consider expansion of their facilities in locations accessable to air travel.

Disagree strongly	Disagree	Agree	Agree strongly

6. It is unfair to levy a tax upon the entire community to develop an airport that will serve only the business interests.

Disagree strongly	Disagree	Agree	Agree strongly

7. The cost of air services is so great that it is unlikely that air transportation will compete with trucks and trains in the transportation of goods and merchandise.

Disagree strongly	Disagree	Agree	Agree strongly

8. In the next decade, more people will be employed in aviation related occupations than in the manufacture of automobiles.

Disagree strongly	Disagree	Agree	Agree strongly

9. Cities or towns with adequately developed facilities for aviation will more likely show continued population and industrial growth.

Disagree strongly	Disagree	Agree	Agree strongly

10. Within the next decade the ability to fly will be as important to an individual as the ability to drive an automobile.

Disagree strongly	Disagree	Agree	Agree strongly

11. The development of aviation and air travel is responsible for the improvement of methods of weather forecasting.

Disagree strongly	Disagree	Agree	Agree strongly

12. A "side effect" of the developing aviation industry has been an improvement of general communications such as radio and television.

Disagree strongly	Disagree	Agree	Agree strongly

13. Aviation is becoming so important in our lives, schools should include this study in their curriculum.

Disagree strongly	Disagree	Agree	Agree strongly

The course should be required for all students _____Yes _____No

The course should teach students how to fly. _____Yes _____No

The course should be limited to ground school content. _____Yes _____No

The content of the course should be included in existing courses such as social studies, physics, general science. _____Yes _____No

14. Aviation has contributed to more interaction with people of other countries.

Disagree strongly	Disagree	Agree	Agree strongly

15. Many items, such as major appliances, are so heavy and bulky that it is impossible to transport them by plane.

Disagree strongly	Disagree	Agree	Agree strongly

16. Aviation, in being able to move people quickly from place to place, has been an important influence on political campaigns.

Disagree strongly	Disagree	Agree	Agree strongly

17. If air transportation and travel had not been highly developed, it is unlikely Alaska and/or Hawaii would have become states.

Disagree strongly	Disagree	Agree	Agree strongly

18. Since world travel and trade are expressions of international cooperation, the United States should develop programs to aid and encourage its growth.

Disagree strongly	Disagree	Agree	Agree strongly

19. To insure a close relationship with the other nations of the Western Hemisphere, an airways system connecting United States with its Central and South American neighbors--including airports, navigational aids, safety rules, meterology, etc.--needs to be encouraged.

Disagree strongly	Disagree	Agree	Agree strongly

20. Aviation, by its involvement with international travel and trade, contributes to greater understanding between nations.

Disagree strongly	Disagree	Agree	Agree strongly

21. The most important contribution aviation has made to the nation is its contribution to the war efforts of the past and present.

Disagree strongly	Disagree	Agree	Agree strongly

22. The influence of aviation in the present war is more important than the influence of infantry and artillery.

Disagree strongly	Disagree	Agree	Agree strongly

In the problems below, determine the response you consider best and circle the letter of the response.

23. The weight of an object causes it to fall when in air or water because usually the object is more dense than the water or air. A balloon will rise when filled with a gas lighter than air. A boat floats because the water displaced is greater than the weight of the boat. What seems to be the best explanation of the reason an airplane is able to rise?

    a. It is filled with a gas that is lighter than air.
    b. It is built with materials light in weight and constructed with large surface areas so that it will not be as heavy as the air it displaces.
    c. The speed of a plane causes the pull of gravity to be unevenly applied and the weight of the plane is offset by the speed.
    d. A pull or force is created above the wing by the speed of the plane which is greater than the pull of gravity.

24. What relationship would best describe an increase of force causing a plane to rise?

    a. Increase the size of the wing and increase the speed of the plane.
    b. Increase the size of the wing and keep speed constant.
    c. Decrease wing size and increase speed.
    d. Decrease wing size and decrease speed.

25. If an airplane is moving north at a speed of 250 miles per hour with no wind what would be the best description of its actual speed if a 50 mph wind developed from the north?

    a. There would be no difference in the actual distance covered.
    b. The actual distance covered in 1 hour would be 300 miles.
    c. the actual distance covered in 1 hour would be 200 miles.
    d. The actual distance covered in 1 hour would be 250 miles but the direction of the plane would be changed.

26. If a plane is moving east at a speed of 200 miles per hour with no wind and wind develops from the north at 50 miles per hour, what direction would the plane be traveling and at what speed?

a. Traveling northeast at approximately 250 mph.
b. Traveling southeast at approximately 20 mph.
c. Traveling somewhat south of east at approximately 210 mph.
d. Traveling somewhat north of east at approximately 210 mph.

27. The atmosphere that man lives in is constantly moving and changing or circulating. Probably the best explanation of this is:

a. Since the earth rotates on its axis this causes the air to be in a constant state of change.
b. The unequal heating of the atmosphere causes some to rise and be less dense enabling the colder more dense air to move into these areas.
c. Colder air does not take up as much space leaving room for warmer air to move in.
d. The sphired shape of the earth explains the tendency for air to move.

28. Under which of the following circumstances would you most expect rain?

a. Over great bodies of water where the sun has a chance to "draw" water and store it in clouds.
b. Over great sunny land areas where the heat of the earth "draws" the water from the air.
c. In areas where the air has been warmed and is being replaced by cold air.
d. In areas where the air is cold and warm air is replacing it.

29. To indicate a given position on the earth, so that its position would be clear to anyone it would be best to:

a. Indicate its position in relation to one of the principle cities of the earth.
b. Indicate its position with latitude and longitude coordinates.
c. Indicate its position in terms of degrees from the prime meridian.
d. Indicate its position in terms of parallels from the equator.

Appendix C

Now that you are completing a course in aviation, we would like to have you complete the following forms. Your responses are added to information we have received from over 2,000 students throughout the United States who have been in aviation courses. Answer as completely as possible:

1. What is your name?

2. What is your parent's occupation? (Try to be as specific as possible. If the job title does not describe the actual work tell what is done.)

3. What do you think is the most important feature of this aviation course?

4. How do you feel the course influenced you?

   a. Your desire to fly

   b. Actual flying

   c. Attitudes about flying

   d. Interest in flying.

OPTIONAL 5. We would appreciate a brief statement of your feelings about the desirability of schools offering courses in aviation. Do you think they should or should not? Why?

Appendix D

Supplementary Information Form

To the student of aviation class:

We would appreciate receiving information from you which we hope will be useful to schools in planning for the needs and interests of their students in the future. In a sense you are unique in that you are one of a very few students nationally who have participated in an aviation class. It is because of this that we request you supply us with the following information:

How would you compare the aviation course with other courses you have taken in high school (check one in each category):

Interests:

1. It was the most interesting course I have had.
2. It was one of the most interesting.
3. It was average in interest.
4. It was not as interesting as most courses.
5. It was the least interesting.

Demands on Student Time:

1. I spent more time on the aviation course than any other course I took.
2. I spent as much time on the course as my more demanding courses.
3. I spent an average amount of time.
4. I spent less time on the course than on most courses.
5. I spent practically no time on the course.

Attitudes Toward Time Spent:

1. I enjoyed the time spent on the aviation class more than the time spent on any other subject.
2. I enjoyed the time spent on the aviation class as much as time spent on other classes.
3. I did not enjoy the time spent on the aviation class as much as time spent on most of my classes.
4. The time spent on the aviation class was least enjoyable compared to time spent on other classes.

If a high school were considering the establishment of an aviation class, what would be your recommendation to them:

1. Strongly recommend the establishment of such a course.
2. Recommend it.
3. Discourage it.
4. Strongly discourage it.

Why:

Do you feel that a course like aviation has "general education" value? That is, do you feel a student can use the aviation course to help develop skills and understandings in other areas? In other words do you feel you have learned additional information or developed more understanding in the following courses:

Science Yes_____
No_____

Social studies Yes_____
No_____

If you can elaborate, please do:

Sex: Male_____ Female_____

Classification: Sophomore_____, Junior_____, Senior_____

Thank you.